

**WHAT IS CLAIMED I**

1 1. A method for rendering an assembly of a first object and a  
2 second object on a user-interface of a device, the device  
3 being either of a first type or of a second type, the first  
4 and second objects presenting data of an application,  
5 the method comprising the following steps:

6 receiving an application specification document by the  
7 device, the application specification document having a  
8 statement with an indication to render the first and second  
9 objects in the assembly;

10 interpreting the statement of the application specification  
11 document to identify a presentation pattern for the assembly  
12 from predefined first and second presentation patterns  
13 according to the type of the device; and

14 rendering the assembly of the first and second objects on  
15 the user-interface according to the presentation pattern  
16 identified in the interpreting step.

1 2. The method of claim 1, prior to the receiving step, further  
2 comprising:

3 specifying the application in the application specification  
4 document by a workbench in a development computer; and

5 simulating the rendering step by a pre-viewer component of  
6 the workbench.

1 3. The method of claim 1, wherein in the rendering step, the  
2 first object and the second objects are rendered according  
3 to the presentation pattern and to a predefined hierarchy  
4 pattern.

1 4. The method of claim 2, wherein the specifying step  
2 comprises:

3     writing the application in an application specification  
4     language;  
5         providing an interpreter specific for the application  
6     specification language; and  
7         storing the interpreter in the device.

1     5. The method of claim 4, further comprising:  
2         storing the predefined presentation patterns by the  
3     interpreter.

1     6. The method of claim 1, wherein the presentation pattern is  
2     as a display pattern, wherein the objects are rendered to  
3     the user-interface being a screen, and wherein the  
4     presentation pattern is identified according to the size  
5     (X) of the screen.

1     7. The method of claim 1, wherein in the rendering step, the  
2     presentation pattern is an audio pattern.

1     8. A computer-program product to visually render a first  
2     object and a second object in an assembly on screen of a  
3     computing device, the objects presenting data of an  
4     application on a computer that is at least temporarily  
5     coupled to the computing device, the device being either of  
6     a first type or of a second type, the computer-program  
7     product having instructions that cause a processor of a  
8     computing device to perform the following steps:  
9         receiving an application specification document from the  
10     computer, the application specification document having a  
11     statement with an indication to render the first and second  
12     objects in the assembly;  
13         interpreting the statement of the application specification  
14     document to identify a visual presentation pattern for the

15 assembly from predefined first and second visual presentation  
16 patterns according to the type of the device; and  
17 rendering the assembly of the first and second objects on  
18 the screen according to the visual presentation pattern  
19 identified in the interpreting step.

1 9. The computer-program product of claim 8 being an  
2 interpreter located in the device.

1 10. The computer-program product of claim 8 being an  
2 interpreter located in a further computer.

1 11. The computer-program product of claim 8 being embodied by  
2 a program signal that is conveyed to the computing device.

1 12. The computer-program product of claim 8 being embodied by  
2 a program carrier.

1 13. A computer-program product that resides in a computing  
2 device of either a first type or a second type, the  
3 computer-program product for interpreting an application  
4 specification document and causing a processor of the  
5 computing device to render a first object and a second  
6 object in combination to a user-interface of the device,  
7 the computer-program product having a plurality of  
8 instructions to control the process, the computer-program  
9 product characterized in that  
10 a first sub-plurality of instructions form a theme-handler  
11 to evaluate a statement of the application specification  
12 document, the statement instructing to render the first and  
13 second objects in an assembly according to a device type  
14 specific presentation pattern for the assembly that is  
15 identified from predefined first and second visual  
16 presentation patterns; and

17       a second sub-plurality of instructions form a navigation  
18 engine to select one of the first and second objects for  
19 interaction with a user to create inter-object relations with  
20 user-interface elements and data cursors.

1       14. The computer-program product of claim 13 being delivered  
2       to the device by a program signal.

1       15. The computer-program product of claim 13 being delivered  
2       to the device by a program carrier.

1       16. A method to create an application system operating with a  
2       computing device, the method comprises the following steps:  
3       a first step to define a user-interface model;  
4       a second step to define an application specification  
5       document by a meta-language;  
6       a third step to customize a workbench component that  
7       identifies constraints on the validity of the application  
8       specification document;  
9       a fourth step to define layout themes for the computing  
10       device;  
11       a fifth step to realize the user-interface model in an  
12       interpreter component; and  
13       a sixth step to realize the layout-themes in the  
14       interpreter component.

1       17. The method of claim 16 wherein the first step comprises:  
2       determining the types of tiles and the functionality of  
3       tiles, the tiles being elements of the user-interface model;  
4       determining relationships between the tiles in an assembly;  
5       and  
6       determining a navigation state and the required user  
7       operations on the navigation state.

1 18. The method of claim 17 wherein the second step comprises:  
2 defining specifications to the types of tiles;  
3 defining attributes to express properties of the tiles; and  
4 defining attributes in the navigation state.

1 19. The method of claim 18 wherein the fourth step for each  
2 computing device comprises:  
3 defining a representation on the output media of device for  
4 each element of the user-interface model; and  
5 defining the user-interface model for each operation of the  
6 user-interface model.

1 20. The method of claim 19 wherein the fifth step comprises:  
2 creating models to specify the tiles and the assembly;  
3 implementing constructors to create user-interface  
4 instances from the application specification document; and  
5 implementing the user-interface instances from the models  
6 in a computer programming language.

1 21. The method of claim 20 wherein the sixth step comprises:  
2 implementing each layout-theme as a layout handler; and  
3 obtaining a selection of the layout-theme by a developer  
4 and forwarding the selection to the interpreter  
5 component.